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Indian Standard
SPECIFICATION FOR FISH WEIGHTS

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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SPECIFICATION FOR FISH WEIGHTS

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(*Continued on page* 8)

Indian Standard
SPECIFICATION FOR FISH WEIGHTS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 30 March 1967, after the draft finalized by the Fluid Flow Measurement Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Rigid rod suspension is considered best to ensure verticality for the measurement of depth and for suspending current meters and sediment samplers. But in large depths and high velocities of water it becomes necessary to use a log line to measure depths and to lower current meters or sediment samplers with suspension cables. Sounding weights are added to the log line or suspension cables to keep them reasonably vertical. The higher the velocity and the greater the water depth, the greater will be the drag caused by the instrument, and the heavier the weights required.

0.3 The shape and dimensions of the weights have an appreciable effect on the normal flow conditions in the channel and, therefore, on the accuracy of flow measurement. As one standard weight cannot be used in all circumstances and too wide a variety of weights is obviously undesirable, this standard sets out a limited number of typical sizes.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers the shape, and dimensions of and the materials to be used for the fish (lead) weights. Typical examples are given in Appendix A.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 1191-1959† shall apply.

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*Rules for rounding off numerical values (*revised*).

†Glossary of terms and symbols used in connection with the measurement of liquid flow with a free surface (*under revision*).

3. FUNCTIONAL REQUIREMENTS

3.1 The weights shall comply with the following requirements.

3.1.1 The fish weights are required to provide protection to the current meter when it is being lowered in water. Therefore, its size should be such as to shield the current meter cups and body.

3.1.2 They shall be streamlined to offer the least obstruction to water.

3.1.3 They shall be provided with Vanes for orienting them correctly in direction of flow.

3.1.4 The specific gravity of the material used for the fish weights should be as high as possible, preferably not less than 7·5.

4. GENERAL

4.1 Normally, a 10 kg fish weight is adequate for use in shallow depths and low velocities when a hand line is used. For larger depths and velocities where power operated gauging reels are used, heavier weights specified below depending upon depth, velocity and type of cable, are used to make the log line or suspension cable hang in as nearly a vertical position as possible. There is no general rule for the choice of the weight to be added but for approximate guidance the following rule which may not be correct in all cases is suggested:

$$\text{Velocity in metres per second} \times \text{Depth in metres} = \frac{\text{Weight in kilograms}}{5}$$

4.2 Normally, a cable of 10 mm diameter is convenient for use with hand line and a 2·5 mm diameter cable gauging reel for high velocity measurement.

5. SIZES

5.1 Weight — The fish weights shall be of 10, 15, 25, 35 and 50 kg weight. The variations in actual weight shall not be more than ± 2 percent.

6. MATERIAL

6.1 The material should be heavy (sp gr greater than 7·5), non-rusting and non-corrodible, preferably lead, nearest to Grade Pb 99·8 of IS : 27-1956*. Cast iron with proper painting may also be used.

7. MARKING

7.1 The fish weights shall be marked with the following details:

a) Its actual weight,
b) Name of manufacturer, and
c) Overall dimensions.

---

*Specification for pig lead (*revised*).

7.1.1 These may also be marked with Standard mark.

7.1.2 The use of the Standard Mark is govered by the provisions of the Bureau of Indian Standards Act, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

APPENDIX A

(*Clause* 1.1)

TYPICAL EXAMPLES OF FISH WEIGHTS

A-1. TYPE 1

A-1.1 These weights should be streamlined to offer least resistance to water and should have vanes attached to the tail end for orienting the attached instrument correctly in the direction of flow. A typical sketch of the weight is shown in Fig. 1. The body of the weight has a circular cross-section with a smooth and uniformly tapering nose so as to provide streamline conditions. Its tail is made to converge to form a smaller cylinder in which four tail fins or vanes are mounted as shown in Fig. 1.

The body of the weight should have a narrow vertical slot for the suspension rod which is secured to the suspension weight by a bolt through a threaded horizontal hole in the body of the weight and suspension rod. The vertical slot should be made wider at the top so as to allow lateral movement of the suspension rod from the vertical axis, to prevent the weight from striking any part of the current meter.

A-2. TYPE 2 (COLUMBUS TYPE)

A-2.1 Figure 2 shows a typical sketch of this type. These weights are also streamlined and have an ellipsoidal shape at the nose, with a tapering body in the rear, but with larger sized tail vanes. The construction should permit the removal of the vanes for straightening or replacement. The shape of the slot for the hanger should permit the hanger to tip forward by 15° from the vertical. All exposed sharp corners of the fins should be rounded off.

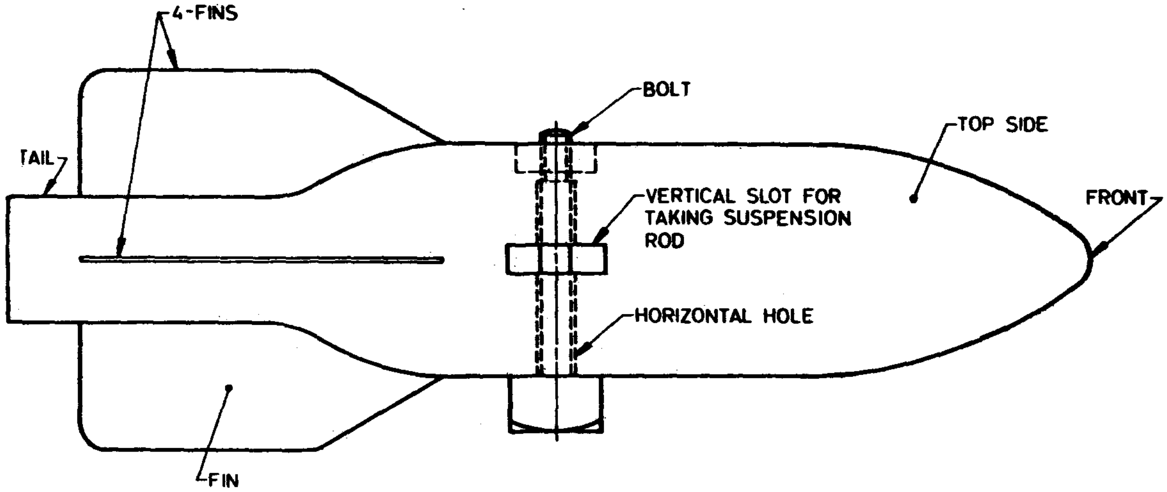
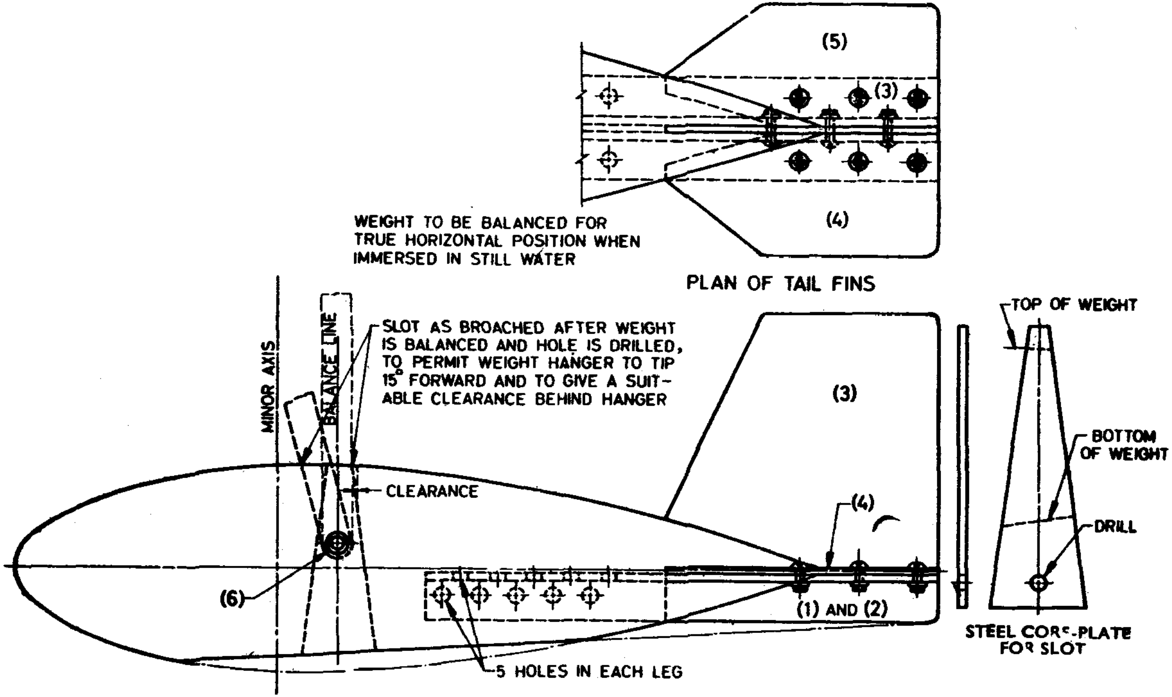


FIG. 1 TYPICAL SKETCH OF FISH WEIGHT, TYPE 1


(5)
(3)
(4)
WEIGHT TO BE BALANCED FOR TRUE HORIZONTAL POSITION WHEN IMMERSED IN STILL WATER
PLAN OF TAIL FINS
MINOR AXIS
BALANCE LINE
SLOT AS BROACHED AFTER WEIGHT IS BALANCED AND HOLE IS DRILLED, TO PERMIT WEIGHT HANGER TO TIP 15° FORWARD AND TO GIVE A SUITABLE CLEARANCE BEHIND HANGER
CLEARANCE
(6)
(3)
(4)
(1) AND (2)
5 HOLES IN EACH LEG
TOP OF WEIGHT
BOTTOM OF WEIGHT
DRILL
STEEL CORE-PLATE FOR SLOT

BOTTOM OF WEIGHT CAST FLAT IN LINE WITH BOTTOM REAR POINT OF TAIL ANGLES

(1) & (2) Two pieces of rolled angles (3) One piece of rolled angle with corner sheared off
(4) & (5) Two pieces with two corners sheared off
(6) Bushing to be in two parts, each part pressed into place and dowelled with clearance between ends of bushings at hanger slot. Hole in bushing should be perpendicular to the plane of vertical fin.

Front portion of weight is a true-ellipsoid with the ratio of major axis to minor axis as 2·6 (approx). All exposed sharp corners of fins to be filed and rounded, pattern should be parted parallel with vertical slot for weight hanger, core prints should be added so that angles (1) & (2) can be cast in weight and fins (3), (4) & (5) can be inserted in finished casting and fastened to angles.

FIG. 2 TYPICAL SKETCH OF FISH WEIGHT, TYPE 2 (COLUMBUS TYPE)

(*Continued from page* 2)

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